



REGISTERED TRADE MARK

ILFORD

BROMIDE and GASLIGHT PAPERS

and how to use them.

**ILFORD, Limited,
ILFORD, LONDON, ENGLAND.**

ILFORD GASLIGHT PAPER

In Nine Varieties.

| | | | | | |
|------------------------|---|---|---|---|---|
| NORMAL | Glossy, Matt, Carbon Surface (<i>semi-matt</i>) | | | | |
| PORTRAIT (soft) | " | " | " | " | " |
| VIGOROUS | " | " | " | " | " |

Ilford Gaslight Paper can be exposed, developed, and fixed by gaslight, lamplight, or other artificial light.

NO DARK ROOM NEEDED.

| Inches | | Inches |
|-------------------------------------|--|--|
| $2\frac{5}{16} \times 1\frac{3}{4}$ | $\left. \begin{array}{l} \\ \\ \\ \\ \\ \end{array} \right\} \begin{array}{l} \text{8d.} \\ \text{Per Packet} \end{array}$ | $4\frac{1}{2} \times 3\frac{1}{2}$ |
| $2\frac{1}{2} \times 2\frac{1}{2}$ | | 5×4 |
| $3\frac{1}{2} \times 2\frac{1}{2}$ | | $5\frac{1}{2} \times 3\frac{1}{2}$ |
| $3\frac{1}{2} \times 3\frac{1}{2}$ | | $5\frac{1}{2} \times 4$ |
| $4\frac{1}{2} \times 2\frac{3}{4}$ | | $5\frac{3}{4} \times 4$ |
| $4\frac{1}{2} \times 3\frac{1}{4}$ | | $6 \times 4\frac{1}{2}$ |
| | | $6\frac{1}{2} \times 4\frac{3}{4}$ |
| | | 7×5 |
| | | $7\frac{1}{2} \times 5$ |
| | | $\left. \begin{array}{l} \\ \\ \\ \\ \\ \end{array} \right\} \begin{array}{l} \text{1s. 3d.} \\ \text{Per Packet} \end{array}$ |

| Inches | |
|--------------------------------------|--|
| 8×6 | $\left. \begin{array}{l} \\ \\ \\ \\ \\ \end{array} \right\} \begin{array}{l} \text{These sizes are sold in} \\ \text{packets, boxes, and tubes} \\ \text{containing various numbers} \\ \text{of sheets. For particulars,} \\ \text{see Current Price List.} \end{array}$ |
| $8\frac{1}{2} \times 6\frac{1}{2}$ | |
| 10×8 | |
| 12×10 | |
| $12\frac{1}{2} \times 10\frac{1}{2}$ | |
| 15×12 | |
| $15\frac{1}{2} \times 12\frac{1}{2}$ | |

Any other sizes to order.

ILFORD GASLIGHT POST-CARDS

Glossy, Matt, Carbon Surface (*semi-matt*).

Ordinary Size ($5\frac{1}{2} \times 3\frac{1}{2}$) and Court Size ($4\frac{1}{2} \times 3\frac{1}{2}$).

In Packets, and Boxes of 100 and 144.

ILFORD, Limited, ILFORD, LONDON, ENGLAND.

ILFORD

Bromide and Gaslight Papers

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The quantities in the formulæ are given in the Avoirdupois and Metric systems. They are not equivalent but the proportions are approximately the same.



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ILFORD BROMIDE PAPER

CARBON SURFACE
(SEMI-MATT)

ILFORD

BROMIDE PAPER

ILFORD BROMIDE PAPER is a development paper coated with gelatino-bromide emulsion. It is intended for the production of prints, either by contact or enlargement, in black and white, sepia, or other tone; and has, apart from variation in tone, such a variety of surfaces, ranging from enamelled glossy to very rough, as to meet every requirement.

Variety :

Characteristics :

Matt Surface

| | | |
|----------------|---|--|
| PLATINO-MATT | { | A very fine porcelain surface, delicate mauve tint. Specially suited for "sketch" and other Portraiture. |
| SPECIAL SMOOTH | | |

| | | |
|--------------|---|------------------------|
| PLATINO-MATT | { | White. A fine surface. |
| SMOOTH | | |

| | | |
|--------------|---|------------------------------------|
| PLATINO-MATT | { | For Enlargement and Broad Effects. |
| ROUGH | | |

| | | |
|------------|---|--|
| VERY ROUGH | { | A decidedly Rougher Surface than Platino-Matt Rough. |
|------------|---|--|

| | | |
|--------------|---|---|
| CREAM SMOOTH | { | Similar Surface to Platino-Matt Smooth. Tones and finishes beautifully. |
|--------------|---|---|

| | | |
|-------------|---|--|
| CREAM ROUGH | { | Similar Surface to Platino-Matt Rough. Tones and finishes beautifully. |
|-------------|---|--|

Glossy Surface

| | | |
|--------|---|---|
| NORMAL | { | Specially suited for Press-work and prints from X-Ray negatives, for rendering fine detail with brilliancy. |
|--------|---|---|

| | | |
|-----------------|---|---|
| RAPID CONTRASTY | { | Specially suited for Press-work. Gives remarkably brilliant prints from flat negatives. |
|-----------------|---|---|

Carbon Surface

| | | |
|-------------|---|--|
| (Semi-matt) | { | Rich velvety surface, combining the brilliancy of the Glossy with the softness of the Matt. Has the appearance of a good Carbon print, especially when Sulphide toned. |
| WHITE | | |

Ordinary Surface

| | | |
|--------|-----|------------------------------------|
| SMOOTH | ... | For all-round work. Finishes well. |
|--------|-----|------------------------------------|

| | | |
|-------|-----|----------------------------------|
| ROUGH | ... | For Enlargements. Finishes well. |
|-------|-----|----------------------------------|

Double Weight

(Thick)

| | |
|---|--|
| { | Supplied in the Matt, Glossy and Carbon Surface (Semi-Matt) varieties. About twice the thickness of the usual papers and requires no mounting. |
|---|--|

Dark-room Illumination.

The paper must be protected from actinic light and the unpacking and all manipulations of the paper, until it is fixed, must be carried out in the dark room, by yellow or orange light, but a considerable quantity of such light may be used, so that all operations can be performed with ease.

The *Ilford Dark-room Light Filter* (S) gives the maximum amount of pleasantly diffused light which is consistent with safety.

Unpacking the Paper.

The sensitive surface of the paper must not be rubbed in any way, and great care must be taken to avoid bringing the fingers or hands into contact with it, especially if they are dirty or moist.

The right side of the paper can be distinguished if it is remembered that in the case of rolls the sensitive surface is on the inside, and in that of the packets one half of the number of sheets face the other half, the two sheets in the middle being face to face. The sensitive side is readily recognised by its tendency to curl inwards.

Suitable Negatives.

The most suitable negatives for contact prints or enlargements are those which will yield the best results with P.O.P. or are best for the production of lantern slides. They must not have very strong contrasts. The high lights should not be too opaque, and the shadows should show a considerable amount of detail. For flat negatives the Contrasty variety should be used.

Contact Printing.

The negative is put film upwards in the printing frame, and carefully dusted. The paper is then placed with the sensitive side in contact with the negative.

Exposure by Contact.

The electric light is the most convenient to use, but any gas or lamp light will serve for making the exposure. With gas a No. 5 burner with a shielded by-pass is the most suitable, and the tap should be turned on full so as to allow the same amount of gas to be passed for each exposure. When a paraffin lamp is used the flame should be maintained at the same height, and kept burning until all the exposures have been made. The lamp must

be enclosed to prevent the escape of light into the room and a shutter should be provided by which to make the exposures, or the paper must be placed in the frame in another room, and the frame covered when being conveyed to the lamp for exposure.

In order to obtain uniform exposures the same light should always be used, and the exposures made at the same distance. If the negatives are classified into four or five groups, according to their density, the worker will, with a little experience, be able to give correct exposures. A yellow-stained negative will require a longer exposure than a neutral-coloured one of similar density.

Ilford Bromide Paper with an average negative requires an exposure of about 8 seconds at 48 inches from a 16 c.p. electric light. At a shorter distance the exposure must be less and vice versa. The exposure necessary is proportional with the square of the distance from the light; twice the distance, four times the exposure; half the distance, one quarter the exposure, and so on.

The following table of approximate exposures with various illuminants is calculated for average negatives at 48 inches from the source of light in each case :—

| Ordinary Gas | | Duplex Paraffin Lamp | | Incandescent Gas | | Incandescent Electric 16 c.p. | |
|--------------|-----|----------------------|-----|------------------|-----|-------------------------------|--|
| Seconds | | Seconds | | Seconds | | Seconds | |
| 20 | ... | 20 | ... | 4 | ... | 8 | |

When a negative has been "improved" by means of paper, matt varnish or colour on the glass side, a screen of ground glass, or tissue paper must be interposed about midway between the light and the printing frame to diffuse the light, and the same plan must be adopted if it is desired to vignette the prints, which can then be done in the usual way. The use of the screen will of course necessitate a longer exposure.

Development.

The image has to be developed in much the same way as a negative, and any recognised developer for bromide paper may be used, but either of the following is recommended :—

METOL-HYDROQUINONE DEVELOPER.

| | | | | | | |
|------------------------------|-----|-----|-----|---------------------|--------|-----------|
| Metol | ... | ... | ... | 7 grains | } or { | 0.4 grm. |
| Hydroquinone | ... | ... | ... | 35 " | | 2 grms. |
| Sodium Sulphite (crystals) | ... | ... | ... | $\frac{1}{2}$ ounce | | 12.5 " |
| Sodium Carbonate (crystals) | ... | ... | ... | $\frac{3}{4}$ " | | 19 " |
| Potassium Bromide | ... | ... | ... | 10 grains | | 0.6 " |
| (or 100 minims 10% Solution) | | | | | | |
| Water up to | ... | ... | ... | 20 ounces | | 500 c.cm. |

AMIDOL (DIAMIDOPHENOL) DEVELOPER.

| | | | | | |
|-----------------------------|-----|-----------|--------|-----|-------|
| Sodium Sulphite (crystals) | ... | 1 ounce | } or { | 25 | grms. |
| Amidol (Diamidophenol) | ... | 50 grains | | 3 | " |
| Potassium Bromide | ... | 8 " | | 4.5 | " |
| (or 80 minims 10% Solution) | ... | | | | |
| Water up to | ... | 20 ounces | | 500 | c.cm. |

The ingredients of the developers should be dissolved in warm water in the order in which they are given. The Metol-Hydroquinone developer will keep in good condition for several weeks in a well corked bottle, but the Amidol developer does not keep for more than a few days.

Take sufficient developer, in a clean dish, to cover the print without difficulty. Immerse the dry exposed paper by sliding it face upwards under the developer, and keep the developer in motion over the print by rocking the dish, or by turning the print over repeatedly. The paper need not be soaked in water previous to development unless it is larger than can be quickly and uniformly covered by the developer in the dry state. A number of prints can be developed together by placing them in the developer rapidly one after the other. The developer may be used repeatedly if a fresh portion of developer is occasionally added, and for so long as it continues to give brilliant prints with good blacks and pure whites.

The image begins to appear in about half a minute, and gradually gains in intensity. Development should be complete in about two minutes at a normal temperature of about 65° Fahr., sooner under warmer, and longer under colder, conditions. As there is really not much latitude in development, the quality of the print depends on a proper exposure, and development for the correct time in a suitable developer. Over-exposure and short development tend to produce flat pictures, whilst a rather short exposure and prolonged development give increased contrasts. Images of a greenish-black tone result from too short development, the use of a stale developer, or one that has been diluted or contains an excess of potassium bromide. An insufficient quantity of bromide in the developer gives a grey image, and sometimes foggy whites.

When development is complete the print should appear somewhat darker by the dark-room light than it will be required when finished. The print should then be removed from the developer, rinsed in clean water for a few seconds, and transferred to the fixing bath.

Fixation.

ORDINARY FIXING BATH.

| | | | | | |
|------------------------|-----|----------|--------|-----|-------|
| Sodium Hyposulphite... | ... | 3 ounces | } or { | 75 | grms. |
| Water up to | ... | 20 " | | 500 | c.cm. |

The fixing bath should be made some time previous to use, or

slightly warmed water used, so that when required the solution will be about the temperature of the room; a fixing bath when made with cold water is reduced to a very low temperature, and if used in this condition may cause the film of the paper to blister.

A fresh portion of fixing solution should be used for each batch of prints and the prints should be kept moving in the bath for ten minutes to ensure complete fixation.

Acid Fixing Bath. This bath is preferable to the ordinary fixing bath and is made by adding $\frac{1}{2}$ ounce (12.5 grms.) of Potassium Metabisulphite to each 20 ounces (500 c.cm.) of the ordinary fixing solution. The bath keeps clean, immediately arrests development, and helps to prevent staining of the prints.

Hardening and Fixing Bath. When the temperature is very high, or when prints with an exceptionally hard film are required, the following solution will be found very efficient:—

| | | | |
|--------------------------|---------------|--------|-----------|
| Potassium Metabisulphite | ... 1 ounce | } or { | 25 grms. |
| Chrome Alum | ... 20 grains | | 1 gm. |
| Sodium Hyposulphite | ... 3 ounces | | 75 grms. |
| Water up to | ... 20 " | | 500 c.cm. |

Dissolve in the order given.

Prints fixed in this bath may, after washing, be dried by heat, after the superfluous water has been blotted off.

Washing after Fixation.

The prints when fixed are washed in running water or in repeated changes of water for from one to two hours, keeping them well separated.

Drying.

The superfluous water is sponged from the surface of the prints, and they may then be laid face upwards either on a clean cloth, blotting paper, muslin stretched on frames, or hung over a line in some place free from dust, or they may be mounted direct. Nothing should come into contact with the gelatine surface during drying or it will adhere thereto.

Flattening the Print.

The print when dry may be more or less curled, but it can be straightened by drawing the back of it several times firmly over the straight edge of a table, or by laying it face down on a piece of American cloth, and then pulling it between the American cloth and a hard flat ruler with a straight edge.

“Clearing” or Reducing.

Occasionally the high lights of the print may be veiled through over-exposure, too prolonged exposure to the light of the dark room, the use of a negative devoid of contrast, or the over-development of the print. This can usually be remedied by “clearing” the print, after it has been fixed and well washed, by immersing it in the following solution until the desired result is obtained, or the print may be laid on a sheet of glass and the reducer applied locally with a pledget of cotton wool. The backgrounds of “sketch” pictures can often be improved in this way. After treatment, the print should be washed for half an hour.

STOCK IODINE SOLUTION

| | | | | | |
|------------------|-----|-----|---------------------|--------|-----------|
| Potassium Iodide | ... | ... | $\frac{1}{2}$ ounce | } or { | 6 grms. |
| Iodine | ... | ... | 20 grains | | 1 gm. |
| Water up to | ... | ... | 10 ounces | | 250 c.cm. |

STOCK CYANIDE SOLUTION

| | | | | | |
|-------------------|-----|-----|-----------|--------|-----------|
| Potassium Cyanide | ... | ... | 40 grains | } or { | 2 grms. |
| Water up to | ... | ... | 10 ounces | | 250 c.cm. |

For use take 1 ounce (25 grms.) of each stock solution and make up to 20 ounces (500 c.cm.) with water. This reducer may be used stronger if found necessary.

Decidedly more contrast may be obtained in a print from a flat negative by giving a little more than the normal exposure and considerable over-development so that a dark print is obtained, followed by reduction in the cyanide reducer.

Alternative Reducer. If unable to obtain Potassium Cyanide owing to its poisonous nature, then reduce in 1 ounce (25 c.cm.) of Stock Iodine Solution made up to 20 ounces (500 c.cm.) with water, and after rinsing, re-fix in the ordinary hypo bath and wash as usual. Any blue discolouration may be ignored as it disappears in the fixing bath.

Enlargements.

The great advantage of Bromide paper for enlargement lies in the fact that the preparation of an enlarged negative is not necessary, the print being made direct on the paper, on to which an enlarged image of the ordinary negative is projected.

Enlarging may be carried out either by daylight or artificial light.

Daylight Enlarging is most conveniently effected by means of an enlarging camera. Several self-contained cameras for this purpose are on the market at reasonable prices. Another plan is

to use the ordinary camera and lens in conjunction with another camera. For large work or where large numbers of enlargements are required a room is darkened by blocking up all the window except an opening to which the back of the camera is placed. The negative is put in the dark slide with the shutters drawn, the film being towards the lens. A reflector covered with white paper is placed outside the window at an angle of 45° to the negative so as to illuminate the negative evenly, and the image projected by the lens is adjusted to size and focused on a sheet of plain white paper placed on an easel. The bromide paper is then substituted for the plain paper and the exposure made.

Enlarging by artificial light is perhaps the most convenient method, as it has the advantage that it can be carried on when daylight is not available, and is an interesting way of occupying the winter evenings. Moreover since the light is under control, it is easier to judge the exposure.

Some form of lantern will be necessary and the source of light may be an oil lamp, an incandescent gas burner, or a small electric arc or lime light. A condenser is required when one of these lights is used, and this must be sufficiently large to cover the whole of the negative. The projecting lens should be large enough to receive the whole cone of light that comes from the condenser, and the light should be centred before and after focusing.

A great disadvantage of using a light which requires a condenser is that the gradation of the enlargement is inclined to be harsh, and retouching or other work on the negative, and scratches are exaggerated. Enlarging without a condenser, which may be carried out with the mercury vapour or half-watt electric light, overcomes this defect. Both these require a white reflector behind the light and a sheet of tissue paper or ground glass placed between the light and the negative to diffuse the light, and produce enlargements equal to those obtainable by daylight.

Vignetting and Shading Enlargements.

Vignetting is easily done by interposing, between the lens and the paper, during exposure, a sheet of cardboard or thick opaque paper, in which a hole is cut of a shape and size to suit the vignette desired. This vignetter should be kept in motion, to and from the paper, so as to soften the edges of the vignette. Parts of a print which otherwise would be too dark may be less exposed, and thereby lightened, by shading with a piece of shaped cardboard.

Soft artistic results are obtained by exposing through a screen of bolting silk placed between the lens and the paper, greater softness being obtained as the distance from the paper is increased.

Exposure for Enlargements.

The exposure required for enlargements depends on the actinic value of the light, the degree of enlargement, the stop in the lens, the sensitiveness of the paper, and also the character of the negative. It will rarely be found necessary to stop down below $f/11$ and it is the best plan always to use the same stop if possible.

The manner in which the size of enlargement affects the exposure is shown in the following table which gives the relative exposures for the common sizes:—

| | | | | |
|---|---------------------|---------------------------------|----------------------------------|----------------------------------|
| <i>From $\frac{1}{4}$-plate to</i> | <i>Half-plate.</i> | <i>Whole plate.</i> | <i>10×8</i> | <i>12×10</i> |
| <i>Relative exposure</i> | 10 | 18 | 25 | 38 |
| <i>From $\frac{1}{2}$-plate to</i> | <i>Whole plate.</i> | <i>10×8</i> | <i>12×10</i> | <i>15×12</i> |
| <i>Relative exposure</i> | 10 | 14 | 22 | 30 |

The best plan is to make trial exposures on a small strip of Bromide paper from a representative part of the negative. Three different exposures should be given in the following way. If the exposure thought to be correct is one minute, expose the whole strip for half a minute, then cover up one third of the paper and give an additional exposure of half a minute, cover up another third of the paper and give a further exposure of one minute. There will thus be exposures of a half, one, and two minutes on the strip of paper, from which on development, the correct exposure can be arrived at.

Development of Enlargements.

The development of enlargements is carried out in exactly the same way as that of contact prints, and all other manipulations are precisely the same.

Defects.

Defects that are not caused by errors of exposure or development, or by the poor quality in the negative, are usually attributable to want of attention to the instructions, or to lack of proper care at some stage of the process.

Stains. Dark stains in patches are due to the prints adhering to one another in the fixing solution, to coming in contact with a dirty dish or table, or to handling the paper or print with chemically dirty fingers.

Yellow stains may be caused by unduly prolonged development, or by chemical contamination in the developer, such as a minute trace of the fixing solution. Yellow or brown stains, not visible at first, but appearing after some time, are due to imperfect fixation or to insufficient washing after fixing.

Spots. Black spots on a print may be due to undissolved particles of chemicals such as Metol, Amidol, etc. in the developer.

Dark brown spots, as a rule, are caused by air bells adhering to the prints in the fixing bath, and thereby preventing fixation at these parts, or by Metol, Amidol, etc. on the paper, in the form of dust, previous to, or even after development.

White spots on the print are usually the result of blemishes on the negative, or air bells in development due to the use of a frothy developer, or carelessness in putting the print into the developer, or in flowing it over the paper.

Surface Markings, dark on the light parts of the print and occasionally light on the dark parts, are caused by the surface of the paper having been rubbed. The dark marks can usually be removed, after the print has been dried, by rubbing the surface firmly with a tuft of cotton wool moistened with water or methylated spirit. In obstinate cases the Iodine-cyanide clearing solution applied locally will entirely remove these stress marks. Surface markings may also be caused by using a scummy developer, but these cannot be removed.

Blisters are generally caused by (1) the solutions and washing water being of widely different temperatures (2) having too much alkali in the developer, (3) using too strong a fixing solution, (4) the use of too strong a sulphide solution when toning, or (5) rough handling of the print. They can very seldom be cured.

Blisters rarely occur when the Amidol (Diamidophenol) developer is employed.

Toning Prints and Enlargements.

The black colour of a Bromide print may easily be changed to sepia, brown, red, blue, or green by toning, but the most satisfactory of these are the sepia obtained by the sulphide method and the purplish-brown by the hypo-alum method.

Sulphide Toning. Two stock solutions are prepared.

STOCK FERRICYANIDE SOLUTION.

| | | | |
|------------------------|---------------|--------|-----------|
| Potassium Ferricyanide | ... 1 ounce | } or { | 25 grms. |
| Ammonium Bromide | ... 1 " | | 25 " |
| Water up to | ... 10 ounces | | 250 c.cm. |

This solution should be kept in the dark. For use take 1 ounce (25 c.cm.) of stock solution and make up to 10 ounces (250 c.cm.) with water.

STOCK SULPHIDE SOLUTION.

| | | | |
|-----------------|---------------|--------|------------|
| Sodium Sulphide | ... ½ ounce | } or { | 12.5 grms. |
| Water up to | ... 10 ounces | | 250 c.cm. |

The crystals of the sodium sulphide should be comparatively

dry; any superfluous moisture should be removed by placing them on blotting paper to drain before weighing.

For use take 1 ounce (25 c.cm.) of stock solution and make up to 10 ounces (250 c.cm.) with water.

The print should be developed with amidol (diamidophenol) developer to just the same depth as for a good black and white print. The finest sepia is obtained when the paper has received an exposure which will allow the print to be fully developed.

The print should be thoroughly washed to remove the last trace of hypo, and then immersed in the ferricyanide solution, and in a few minutes the image should be quite bleached. It is then washed for a few minutes and placed in the sulphide solution in which it will soon acquire a rich sepia colour. After which it is washed for half an hour.

Yellowish tones are caused by too short development of the print, traces of hypo in the sulphide bath or the use of deteriorated sulphide crystals or solution. Bleaching of the light half-tones in the print is caused by traces of hypo in the ferricyanide solution, or in the print.

Gray stains are caused by the print having been contaminated with developer, during bleaching, or in the washing before sulphiding. Blue stains are due to contact with iron, frequently present in the water in the form of rust; these can be prevented if the water is filtered through several thicknesses of flannel fastened over the water tap.

Hypo Alum Toning.

| | | | |
|---------------------|-------------------------|--------|-----------|
| Sodium Hyposulphite | ... 3 ounces | } or { | 75 grms. |
| Alum (powdered) | ... $\frac{1}{2}$ ounce | | 12.5 " |
| Boiling Water up to | ... 20 ounces | | 500 c.cm. |

Dissolve the hypo in the water and then add the alum, stirring until it has dissolved. Allow to cool to about 120° Fahr., and to prevent the first batch of prints being unduly reduced, tone a few waste bromide prints in it. It is immaterial whether the precipitate formed be left in the solution during toning or not. The used solution should not be thrown away as it improves with use, but should be strengthened when necessary by the addition of some fresh solution.

The prints reduce somewhat in toning, therefore they should be rather deeper than the final result is required. After fixing and washing they must be treated for five minutes with an alum bath, and after such treatment should be washed for a short time, and then placed in the hot hypo-alum solution in which they should be kept moving. The toning bath should be kept as nearly as possible at a temperature of 120° Fahr. The best plan to accomplish this is to use an enamelled iron or porcelain dish which is supported on two stirring rods or thin strips of wood placed in a larger enamelled dish, which is then put over a gas ring or oil stove. The outer dish is filled with water and the toning solution is decanted from the precipitate into the inner dish, which should contain a

thermometer. At a lower temperature toning is unduly prolonged, whilst higher temperatures give colder sepia tones. At the temperature recommended toning should be completed in about twenty minutes. When the print is toned it should be placed direct from the toning bath into a weak tepid solution of alum for a few minutes, and then washed in water for an hour. Any deposit on the prints should be sponged off before they are taken from the washing water.

Toned prints may be cleared or reduced with the Iodine-cyanide solution as is described for black and white prints.

Red Chalk Tones are obtained by toning a thoroughly washed sulphide or hypo alum toned print in a rather strong gold and sulphocyanide toning bath and again fixing and washing it.

In addition to the above, any of the recognised methods of toning may be used with Ilford Bromide Papers.

Enamelling.

Prints with a glossy surface may be enamelled or glazed by drying them in contact with ferrotype or glass. The glazing material must be thoroughly cleaned and polished with French chalk or the prints may eventually refuse to strip from it.

The glass or ferrotype is flooded with water and the wet prints are placed face downwards on it. A sheet of waterproof cloth is then laid over the prints and pressure is applied with a roller squeegee to ensure perfect contact and freedom from air-bells. The waterproof cloth is then removed and the prints are placed in a current of air until perfectly dry, when a penknife is passed under one corner of the print, and it is stripped from the glass or ferrotype.

Glazing solutions, which obviate the necessity of polishing the glass, and which also overcome any liability of the prints to adhere to it, can be obtained on the market.

Trimming.

Trimming is most satisfactorily done by means of a "desk trimmer," but the print may also be trimmed by laying it face upwards on a sheet of glass, and cutting it with a sharp penknife, guided by a straight edge; or a glass cutting shape of the size required is placed in position on the print, and the edges cut away with the knife.

In trimming the print, due regard must be paid to the composition of the picture.

Mounting.

The dry method of mounting with adhesive tissue is undoubtedly the best. Prints done in this way remain always flat after mounting, even when mounted on thin paper, and may be mounted

on almost any material without any risk of suffering from impurities in it.

When wet mounting has to be resorted to it is essential that the mount be chemically pure, and freshly made thick starch paste should be used. The paste is spread evenly over the back of the print, which may be either wet or dry, and then should be placed in position on the mount. The print is then covered with a sheet of ordinary white paper or fluffless blotting paper and firmly rubbed or rolled into contact with the mount. Any loose paste adhering to the print or mount should be sponged off, and the picture placed to dry where it will be free from dust.

It is important that the mount should not be obtrusive; it should enhance the value of the picture and not compete with it.

Spotting.

Most blemishes in prints and enlargements can be removed by "spotting" or "scraping." Water colour paint of suitable tint should be applied with the tip of a No. 2 sable spotting brush to white spots or marks, so as to match the surrounding part of the picture. For black and white prints India ink, with a trace of blue if found necessary, is the most suitable, whilst for sepia prints it may be necessary to mix a little Indian red or India ink, or even both to sepia colour, so as to match closely the tone of the prints. With certain papers some gum arabic should be added to the colour to match the surface. Small faint spots may be removed with an ordinary lead pencil. Dark spots or marks may often be erased by scraping the part with a sharp knife, held at almost a right angle to the surface of the print, care being taken that the film is not completely removed and the paper laid bare.

Finishing.

For various methods of "working up" or "finishing" Bromide prints and enlargements by brush and "aerograph" with water colours, and with pencils and chalks, reference should be made to the Ilford Manual of Photography, or books dealing specially with this subject.

Permanence.

Bromide prints, either untuned or sulphide toned, are quite permanent, providing that they have been thoroughly fixed, afterwards well washed, and otherwise carefully made.

Bromoil Printing.

Ilford Bromide Papers, especially the Carbon-surface (semi-matt) are particularly suitable for the Bromoil process. In this

process the silver image is bleached, and the gelatine tanned or hardened with a solution containing a bi-chromate, so that its power of absorbing water is inversely proportional to the density of the original image, and its power of taking a greasy ink directly proportional to the strength of the original silver image.

A Bromide print is exposed, either by contact or by enlarging, and developed in the usual way in the Amidol (diamidophenol) developer, fixed in a plain hypo solution and thoroughly washed. It must be full of detail in the lights, and the shadows must not be too heavy.

Bleaching.

STOCK BLEACHING SOLUTION.

| | | | | | |
|-------------------------|-----|-----|---------------------|--------|------------|
| Copper Sulphate | ... | .. | $\frac{1}{2}$ ounce | } or { | 12.5 grms. |
| Potassium Bromide | ... | .. | $\frac{1}{2}$ " | | 12.5 " |
| Potassium Bichromate | ... | 12 | grains | | 0.6 " |
| Sulphuric Acid (strong) | ... | 10 | minims | | 0.5 c.cm. |
| Water up to | ... | ... | 10 ounces | | 250 " |

Dissolve in warm water, adding the acid first. This solution keeps well.

For use add 1 part of stock solution to 3 parts of water.

Immerse the print, which may have been previously dried or not as is most convenient, in the bleacher and allow it to remain for about two minutes after the deepest shadow has bleached. It is then washed for a few minutes and fixed in the following solution:—

| | | | | |
|---------------------|-----|-----------|--------|-----------|
| Sodium Hyposulphite | ... | 1 ounce | } or { | 25 grms. |
| Water up to | ... | 10 ounces | | 250 c.cm. |

After washing the hypo out of the print soak it for about half an hour, at a temperature of from 70° to 80° Fahr. in the following:—

| | | | | |
|--------------|-----|---------------------|--------|---------|
| Ammonia '880 | ... | $\frac{1}{4}$ ounce | } or { | 6 c.cm. |
| Water up to | ... | 10 ounces | | 250 " |

Wash again for a few minutes and the print is ready for pigmenting.

Pigmenting. The wet print is laid face up on a pad of several thicknesses of blotting paper which must be kept wet so as to keep the print moist during the process. The superfluous water is dabbed from the surface of the print with a piece of soft linen, and the image is then ready to be built up in ink. The print should have a margin of about half an inch all round the image, as it is difficult to apply the colour right up to the edges of the paper.

Fine printers' ink may be used, but it is preferable to obtain inks which are put up especially for this work. Special brushes of different kinds and sizes are necessary, a small palette knife, and a piece of opal glass or a white tile to act as a palette, on which to mix the colour.

A small portion of ink is put on the palette and spread thinly out with the palette knife. Only a small quantity of ink should be taken up on the tip of the brush, and this must be dabbed on a clean part of the palette to distribute the ink evenly on the tip of the brush. The ink is then applied to the print with a dabbing, dragging or painting motion, according to the effect desired; beginning with the shadows and leaving the light half-tones until the ink on the brush is reduced in quantity. At first the print will take the ink all over but if the gentle dabbing be continued the colour will be seen to leave the lighter parts, and pile upon the darker. The longer the action is continued the finer the grain of the deposit becomes, whilst fine detail is secured at the same time. It is essential that the ink should be stiff, and the minimum applied to the print, and it may be found necessary to have it thinned a trifle with medium for the lighter tones.

Stiff ink gives contrast whilst thin ink tends to yield a flat image with excess of detail. The character of the print depends considerably upon the way in which the brushes are manipulated.

After the print has been worked over, artistic taste and knowledge have their scope; shadows may be strengthened by re-inking; or any part of the print lightened by tapping with a dry brush. Detail may be suppressed by delicately smudging; high lights may be exaggerated by dragging with a small brush free from ink, and skies may be introduced into landscapes.

As the wet print will take some days to dry thoroughly, it should be placed where dust will not fall on it. After it is dry it may again be worked on; for example, the shadows may be further strengthened with a brush and ink, or the highest lights accentuated by removal of the colour with ink eraser or a small sharp knife.

The thoroughly dried print may be mounted by any of the usual methods.

Iford Bromide Post-cards are manipulated in the same way as the papers.

Instruction in fuller detail, in relation to all branches of Bromide work, is given in the "Iford Manual of Photography."

Certinal.

(THE ILFORD LIQUID UNIVERSAL DEVELOPER).

Gives good results with Iford Bromide Papers and requires the addition of water only to be ready for use.

| | | | | |
|----------|-----|-----|-----|-----------|
| Certinal | ... | ... | ... | 1 part. |
| Water | ... | ... | ... | 30 parts. |

ILFORD

GASLIGHT PAPER

ILFORD GASLIGHT PAPER is a development paper, and is intended for making prints in black and white. It is supplied in three distinct qualities, which give three different scales of gradation; "Normal" for printing from ordinary negatives; "Portrait" (soft) for printing from strong negatives; and "Vigorous" for negatives weak in contrast. Each of these is coated on three different papers; Glossy Surface, Matt Surface, and Carbon Surface (semi-matt). From these, a paper can be chosen to suit any negative of reasonable gradation, or a surface to suit any taste.

In many respects Gaslight paper is similar to Bromide paper in the working, the difference being chiefly that it is very much slower and develops more quickly, and can consequently be manipulated in comfort in an ordinary room, illuminated with gas, lamp, or electric light, provided that it is kept at least six feet from the source of light, or if nearer to it, is shielded from the direct rays.

Almost any kind of negative will give at least a passable print on Gaslight paper, if the variety most suitable for its gradation is chosen. For instance, the "Vigorous" variety would give the best print from a thin under-developed, or a greatly under-exposed flat negative, whilst the "Portrait" variety would produce the best result from a hard over-developed negative and so on. All the varieties of the paper are of similar speed and require the same development.

The paper is put up so that the sensitive side of one half of the number of sheets in the packet faces the other half, but the sensitive side is readily distinguished by its inclination to curl inwards.

Exposure.

A piece of the paper is placed on the negative in the printing frame, the sensitive side of the paper being in contact with the film of the negative, and the exposure is made by placing the frame in front of the light of an ordinary gas burner, paraffin lamp, or electric lamp. The exposure depends upon the density and colour of the negative, the actinic power of the light, and the distance from it. An approximate exposure for a negative of average density, at

six inches from the source of light would be, with ordinary gas or Duplex Paraffin 30 seconds, Incandescent Gas 6 seconds, and with a 16 c.p. Electric 12 seconds. For negatives larger than half-plate the printing distance should be increased, so as to obtain even illumination, and a proportionately longer exposure given. The same light should always be used and the printing frame placed at the same distance from it. This distance should be kept unchanged, as it is only in this way that uniform exposures can be depended upon.

Development.

Any formula recognised for the development of gaslight papers may be used, but bromide-paper developers are as a rule unsuitable as they generally give hard and greenish results. The following developer is particularly suitable:—

METOL-HYDROQUINONE DEVELOPER.

| | | | |
|----------------------------------|-----------|--------|-----------|
| Metol (or Metol substitute) ... | 10 grains | } or { | 0.6 grms. |
| Sodium Sulphite (crystals) ... | 1 ounce | | 25 " |
| Hydroquinone | 35 grains | | 2 " |
| Sodium Carbonate (crystals) ... | 1 ounce | | 25 " |
| Potassium Bromide (10% solution) | 20 minims | | 1 c.cm. |
| Water up to | 20 ounces | | 500 " |

Dissolve in the order given in warm water. (If a substitute for Metol is used, it must be one which behaves like Metol.) The developer will keep in good condition for several months in a well corked bottle.

Amidol (diamidophenol) developer may be used, but the results are not quite so fine as those obtainable with Metol-Hydroquinone.

AMIDOL DEVELOPER.

| | | | |
|----------------------------------|-----------|--------|-----------|
| Sodium Sulphite (crystals) ... | 1 ounce | } or { | 25 grms. |
| Amidol (diamidophenol) ... | 50 grains | | 3 " |
| Potassium Bromide (10% solution) | 15 minims | | 0.8 c.cm. |
| Water up to | 20 ounces | | 500 " |

Dissolve in the order given in warm water. This solution becomes stale in a few days.

Sufficient of the developer to cover the print is poured into a clean developing dish, and the exposed paper is carefully and rapidly glided, face upwards, under its surface and the developer is kept in motion over the print by rocking the dish.

The image should flash up very rapidly, and development should be completed in from twenty to thirty seconds at a normal temperature of about 65° Fahr. A careful watch should be kept

for air bubbles adhering to the surface of the paper ; these should be broken with the finger tip.

If development is not complete within thirty seconds it may be taken for granted that the exposure has been insufficient, unless the developer is exceedingly cold, diluted, or additional bromide has been used. Nothing is gained by trying to force development ; it merely conduces to fog through prolonged exposure to the light of the room, or to yellowness from the action of the developer.

There is not a great deal of latitude in the development of a gaslight print, therefore the exposure must be so regulated that development is finished in the time given. The developer is so constituted that the best gradation and colour are obtained with it under these conditions.

Warmer blacks are obtained by diluting the developer, or adding a little more bromide to it ; development consequently taking a little longer. An excess of bromide, or too much dilution, will tend to produce greenish-blacks. Less bromide gives a bluish-black image, whilst the omission of it altogether would result in foggy whites.

The same developer may be used repeatedly, so long as it gives a good black image with pure whites. The print should not be unduly exposed to the atmosphere from the time it is put into the developer until it has been fixed and rinsed, otherwise the purity of the whites may be impaired.

Fixation.

When development is complete the print is removed from the developer and well rinsed in water for a few seconds, and at once placed in the fixing solution, care being taken that it is properly covered with the solution.

FIXING BATH.

| | | | |
|----------------------------|----------|--------|-----------------------|
| Sodium Hyposulphite | 3 ounces | } or { | 75 grms. 500 c.cm. |
| Water up to | 20 „ | | |

A fresh portion of solution should be used for fixing each batch of prints, and the prints should be turned over several times during the ten minutes which are necessary for their complete fixation. The prints may remain in the hypo until the batch is finished, unless it is a large one. Stains may occur if the prints stick together, or rise above the surface of the solution, before they are fixed. It is not advisable to use hypo solution in which bromide prints have been fixed, or to fix gaslight and bromide prints together.

The **Acid Fixing Bath** given on page 7 is preferable ; it has the advantage that it immediately arrests development, remains

colourless, and thereby tends to preserve the purity of the whites.

The Hardening and Fixing Bath given on page 7 may be used if necessary.

Great care must be taken that the fixing solution is not introduced into the developer, as even the minutest trace of hypo in it, or contact with hypo at any stage prior to fixing, will cause stains on the prints.

Washing, etc.

Washing the prints for an hour in running water, or repeated changes will be sufficient to eliminate the hypo from them, provided they are kept in motion. After this, the superfluous water is sponged from the surface of the prints, which may be dried by placing them face upwards on clean cloth or pure blotting paper, or by pinning them to the edge of a shelf or table, away from dust.

It is imperative that the hands and dishes should be absolutely chemically clean. A dish should be kept exclusively for developing, and although it may become stained with the developer, it may be considered clean for its purpose, if it be thoroughly washed after each time of using. The surface of the print should not be brought in contact with the bottom of the dish, whilst in the developer.

Ilford Gaslight Paper may be Enamelled, Toned, Finished, Mounted, etc., in the same way as is described for Ilford Bromide Paper.

Ilford Gaslight Post-cards are manipulated in the same way as the papers.

The "Ilford Manual of Photography" gives fuller instructions for making successful prints on Ilford Gaslight Papers.

Certinal.

(THE ILFORD LIQUID UNIVERSAL DEVELOPER).

Gives good results with Ilford Gaslight Papers and requires the addition of water only to be ready for use.

| | | | | |
|----------|-----|-----|-----|-----------|
| Certinal | ... | ... | ... | 1 part. |
| Water | ... | ... | ... | 15 parts. |

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For Prices see Current Price List.

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 " Rough

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